



LABORATÓRIO DE INSTRUMENTAÇÃO  
E FÍSICA EXPERIMENTAL DE PARTÍCULAS  
*partículas e tecnologia*



# Physics Olympiads

*Motivating the young for  
the excellence in physics*

*Pedro Abreu for the IPhO2018 LOC, IPPOG Autumn Meeting, Oct/2018*



# Hello!



I am Pedro (.abreu, pedro abreu)

Today I am here to speak about the Physics Olympiads.

You can find me at *abreu@lip.pt*



# 1. SPF

Sociedade Portuguesa de Física  
Portuguese Physics Society

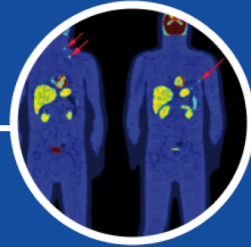


It is a society of physicists, research and teachers alike, engaged with the promotion of physics in Portugal and in Europe, along with its EPS partners.

It is responsible for the Physics Olympiads in Portugal, under mandate by the Ministry of Education of the Portuguese Republic.



## 2. The Physics Olympiads



# A competition for high-school students

- 2 Levels  
**A-level** for kids up to 14 yrs. old, teams of 3  
**B-level** for high-school students, individuals
- School selection – one theoretical exam (75 mins.)  
3 students/level selected for the next phase
- Regional selection – one theoretical + one practical exam (75+85 mins.)  
3 best A teams/region selected for the next phase (1 in Madeira, 1 in Azores)  
10 best B students/region selected for the next phase (3 in Madeira, 3 in Azores)
- National selection – one theoretical + one practical exam  
3 best A teams get Gold/Silver/Bronze medals => possibility to participate in EUSO  
20 best B students (3 best get Gold/Silver/Bronze medals, 7 get Honourable Mentions)  
selected to participate in special training for the international olympiads



# It all started in 1985 (posters since 1997)

- A few hundred students in the regional phase (up to 2005); since then ~1000 students.
- Up to 2010 (incl.), only 57 students in the national phase; since then, 69 students in nat'l phase

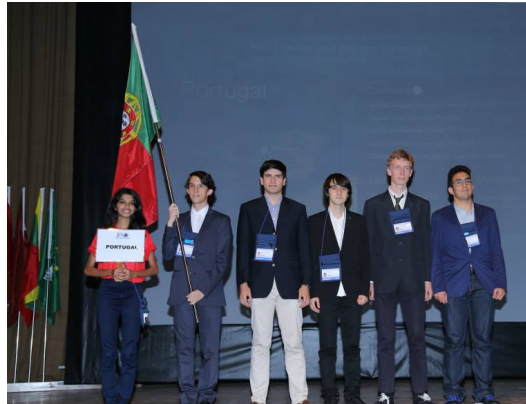


2018 Participation increased by ~30% Largest Experimental competition in Pt. 6/15

...and went international in 1993

## Portugal in IPhO

Portugal participates since 1993 (as observer) and in the competition since 1994



The portuguese participants are selected among 20 pre-selected students in the previous national olympiad, after an intense training and preparation, ending with the long selection exam (5h theory, 3h experimental)



**Results in the 22 years of participation:**

- 1 Silver Medal
- 11 Bronze Medals
- 23 Honourable Mentions



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Lisbon, Portugal

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IPhO 2018

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# In 2018: a great! challenge

In 2018, the International Physics Olympiad – IPhO – took place in Lisboa, last week of July

More info:  
<http://ipho2018.pt/>

- Record participation of 87 countries (registered)
- Involved ~1000 people: 400 students, 270 professors and 100 markers, 140 guides, 50 volunteers and supporting staff
- Highly challenging experiments and problems, extremely tight schedule



- People from Univ. strongly involved: LOC, Markers, other activities (undisclosed)

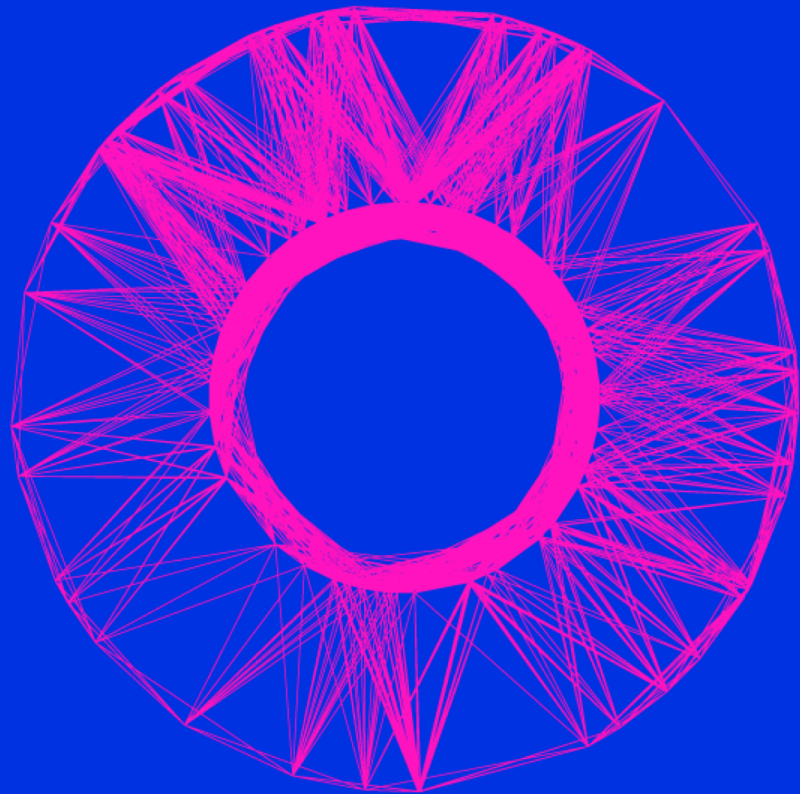


# IPhO 2018 Lisbon, Portugal 21-29 Julho

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# IPhO 2018 Lisbon

## Organization

### Responsible Entities

#### GOVERNAMENTAL ENTITIES

Ministry of Education

Ministry of Science, Technology  
and Higher Education

#### EXECUTIVE ENTITY

Portuguese Physical  
Society



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# International Physics Olympiads (IPhO)

Largest International competition in Physics for high-school students

Happens annually since 1967

About 80-85 countries participate regularly

A delegation consists of up to 5 students and up to 2 leaders (and observers)



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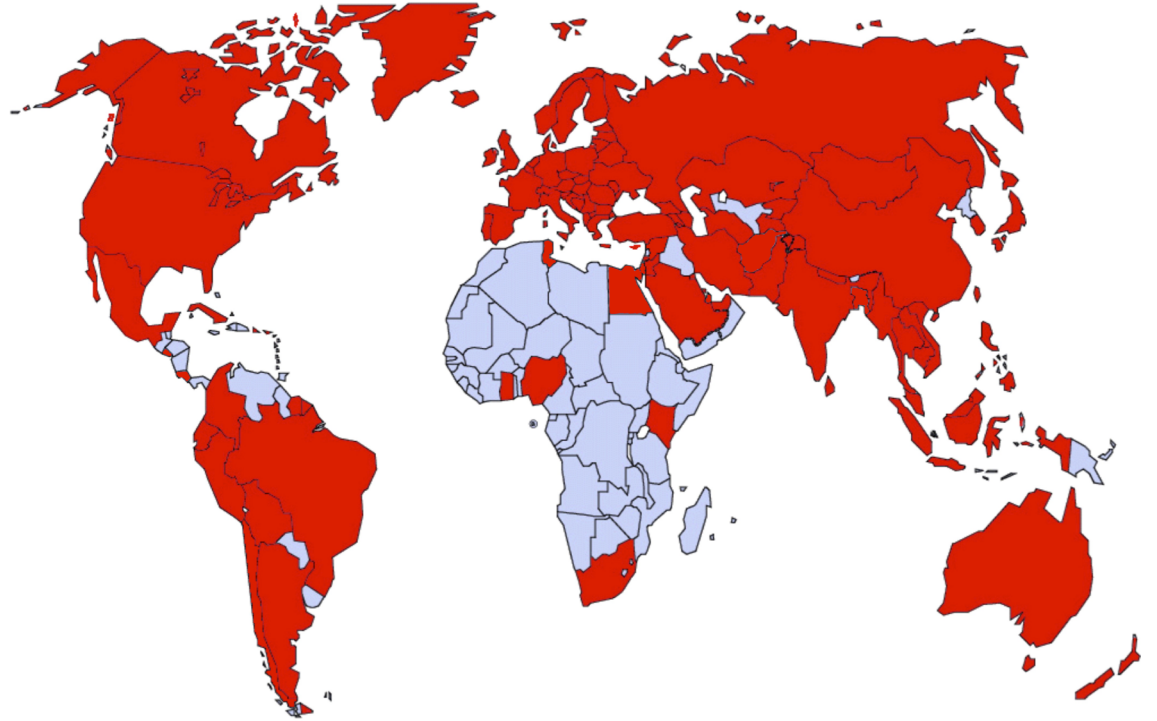
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Participants

at IPhO

[ipho.org](http://ipho.org)



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# The editions previous to the portuguese one

| Number | Year | Host Country                                                                                     | Host City     |
|--------|------|--------------------------------------------------------------------------------------------------|---------------|
| XII    | 1981 |  Bulgaria       | Varna         |
| XIII   | 1982 |  West Germany   | Malente       |
| XIV    | 1983 |  Romania        | Bucharest     |
| XV     | 1984 |  Sweden         | Sigtuna       |
| XVI    | 1985 |  SFR Yugoslavia | Portorož      |
| XVII   | 1986 |  United Kingdom | London-Harrow |
| XVIII  | 1987 |  East Germany   | Jena          |
| XIX    | 1988 |  Austria        | Bad Ischl     |
| XX     | 1989 |  Poland         | Warsaw        |
| XXI    | 1990 |  Netherlands    | Groningen     |
| XXII   | 1991 |  Cuba           | Havana        |
| 23     | 1992 |  Finland        | Helsinki      |
| 24     | 1993 |  USA            | Williamsburg  |
| 25     | 1994 |  China          | Beijing       |
| 26     | 1995 |  Australia      | Canberra      |
| 27     | 1996 |  Norway         | Oslo          |
| 28     | 1997 |  Canada         | Sudbury       |
| 29     | 1998 |  Iceland        | Reykjavik     |

| Number | Year | Host Country                                                                                                                                                                                          | Host City                |
|--------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 30     | 1999 |  Italy                                                                                                             | Padova                   |
| 31     | 2000 |  United Kingdom                                                                                                    | Leicester <sup>[3]</sup> |
| 32     | 2001 |  Turkey                                                                                                            | Antalya                  |
| 33     | 2002 |  Indonesia                                                                                                         | Bali                     |
| 34     | 2003 |  Taiwan                                                                                                            | Taipei                   |
| 35     | 2004 |  South Korea                                                                                                       | Pohang                   |
| 36     | 2005 |  Spain                                                                                                             | Salamanca                |
| 37     | 2006 |  Singapore                                                                                                         | Singapore                |
| 38     | 2007 |  Iran                                                                                                              | Isfahan                  |
| 39     | 2008 |  Vietnam                                                                                                           | Hanoi                    |
| 40     | 2009 |  Mexico                                                                                                            | Mérida                   |
| 41     | 2010 |  Croatia                                                                                                           | Zagreb                   |
| 42     | 2011 |  Thailand                                                                                                          | Bangkok                  |
| 43     | 2012 |  Estonia                                                                                                           | Tartu and Tallinn        |
| 44     | 2013 |  Denmark                                                                                                           | Copenhagen               |
| 45     | 2014 |  Kazakhstan                                                                                                        | Astana                   |
| 46     | 2015 |  India                                                                                                             | Mumbai                   |
| 47     | 2016 |  Switzerland and  Liechtenstein | Zurich                   |
| 48     | 2017 |  Indonesia                                                                                                         | Yogyakarta               |

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# Portugal in IPhO

## Event Organization

### The recent and next events

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| Ano         | IPhO            |
|-------------|-----------------|
| 2017        | Indonésia       |
| <b>2018</b> | <b>Portugal</b> |
| 2019        | Israel          |
| 2020        | Lituânia        |
| 2021        | Singapura       |
| 2022        | Japão           |
| 2023        | Irão            |
| 2024        | França          |
| 2025        | Colômbia        |
| 2026        | Hungria         |

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Portugal proposed in July 2000 to organized the IPhO.

The first slot available was 2018.

It is an event of the responsibility of the Ministry of Education, that delegated the organization to the Portuguese Physics Society.

The budget is large. In asean countries can go above 5 M€.

In Switzerland+Liechtenstein 2017 the budget was ~4 M€.

Our comparison was more close to Spain 2005 => 1,4 M€.

We proposed a budget of 1,1 M€ that was accepted only when it reached 950 k€ after negotiation; and Gov't only pays 480 k€ !

Fees (3,5 k€/delegation) + Sponsors have to cover remaining costs

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# IPhO 2018 Lisbon, Portugal

21-29 JULY

Event duration of **8 days** in which the Organization takes care of everything!

- Opening and Closing Ceremonies with the attribution of prizes
- 1 experimental exam, 1 theoretical exam
- Preparation, discussion, approval, correction of the exams
- Touristic and social events for all participants



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# IPhO 2018 Lisbon, Portugal

About **650** participants  
from **90** different countries  
(400 students,  
250 Leaders and Observers)

**Excellent opportunity to promote the country, and what is done best in the country, to an exceptional and international public.**

Hard logistics / high numbers part.'s  
Tough Exams  
Diversity of cultures / food needs  
Security / Health / Crisis management  
Media / Bulletin / Public Relations



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# IPhO 2018 Lisbon, Portugal

International Board meeting room (Exams discussion)



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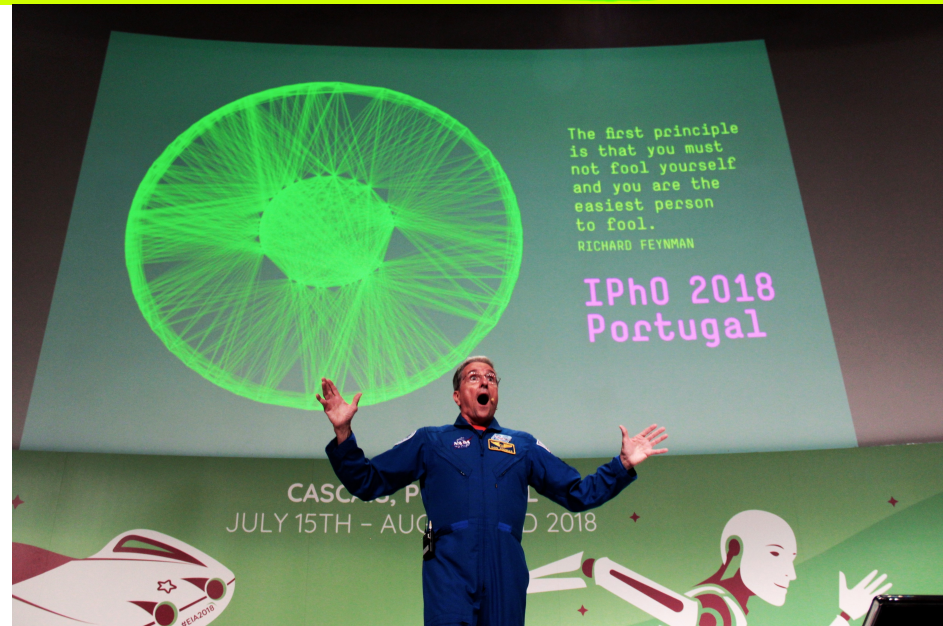
HELP!

Sec  
IPh



# IPhO 2018 Lisbon, Portugal

Events (seminar with the Astronaut Don Thomas)



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# IPhO 2018 Lisbon, Portugal

Closing Ceremony



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## MAIN SPONSORS



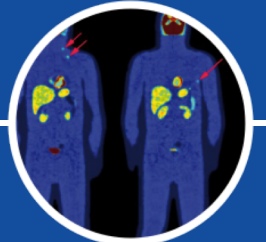
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# 3. Take-home messages



The IPhO's are the top of a pyramid. Many more students are engaged in schools at earlier times.

The IPhO's put Physics on the media and [should] involve strongly the physics community(ies).

The IPhO's set a standard for an excellency in studying/teaching/practicing in physics and education.



*Planting  
a future*

# Thanks!

to all the people collaborating in all these activities!  
...and for your attention!

## Any questions?

You can find me at [abreu@lip.pt](mailto:abreu@lip.pt)



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